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Mikroglob

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CHANGELOG				
Ver.Rev	Date	Modified by	Section/ Paragraph modified	Change description
1.0	30.04.2025	JBO, NCZ	All	First issue
1.1	30.04.2025	JBO	Section 2	Explanation of report naming convention in the introduction.
			Section 6.3	A new section concerning launch systems.

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1 Applicable and reference documents

Applicable and reference documents are listed in tables below.

1.1 Applicable documents

No	Doc title	Doc Identifier	Ver.Rev
AD1.	Umowa MIKROGLOB02	AU/135/V/2024	20.12.2024
AD2.	Umowa MIKROGLOB01	132/V206/ZW/ZOT/USŁ/SS/2022/341	24.05.2023
AD3.	MGB01-L-M-D-000_02-ES-M2	Executive Summary M2	2.0
AD4.	MGB01-L-M-D-109_01-MDRORP	MDR Organization Review Procedure	1.0
AD5.	MGB01-L-Q-D-111_01-GAD	Glossary_of_abbreviations_and_definitions	4.0
AD6.	MGB01-L-M-D-208_01-CVRORP	CVR Organization Review Procedure	1.0
AD7.	MGB01-L-M-D-000_04-ES-M4	Executive Summary M4	3.0
AD8.	MGB01-L-M-D-000_02-M6	Executive Summary phase A2 M6	1.0
AD9.	MGB01-L-E-D-101_01-MDD	Mission Description Document	1.0
AD10.	MGB01-L-M-D-321_01	PRR RID Summary	1.0
AD11.	MGB01-L-M-D-321_01	PRR RID Summary	1.0
AD12.	MGB01-L-M-D-110_01	MDR RID Summary	1.0
AD13.	MGB01-L-M-D-315_01-FR	Final Report	V1.0
AD14.	Annex 1 to MGB01-L-E-D-101_01-MDD	Annex 1 to Mission description document	1.0
AD15.	Annex 2 to MGB01-L-E-D-101_01-MDD	Annex 2 to Mission description document	1.0
AD16.	Annex 3 to MGB01-L-E-D-101_01-MDD	Annex 3 to Mission description document	1.0
AD17.	MGB01-L-E-D-101_02-RJ	Requirements justification file	1.0
AD18.	MGB01-L-E-D-101_03-SEP	System engineering plan (phase 0)	1.0
AD19.	MGB01-L-E-D-101_04-TRSL	Technology Readiness Status List (phase 0)	1.0

AD20.	MGB01-L-M-D-102_01-SCH	Schedule (phase 0)	1.0
AD21.	MGB01-L-M-D-102_02-CER	Cost estimate report (phase 0)	1.0
AD22.	MGB01-L-E-D-103_01-SysCon	System concept report (phase 0)	1.0
AD23.	Appendix 1 to MGB01-L-E-D-103_01-SysCon	Appendix 1 to System concept report	1.0
AD24.	MGB01-L-E-D-103_02-TRO	Trade off reports	1.0
AD25.	Annex 1 to MGB01-L-E-D-103_02-TRO	Annex 1 to Trade off reports Constellation design trade off report	1.0
AD26.	Annex 2 to MGB01-L-E-D-103_02-TRO	Annex 2 to Trade off reports Optical payload trade off report	1.0
AD27.	Appendix 1 to MGB01-L-E-D-103_02-TRO-	Appendix 1 to Trade off reports Constellation design trade off report	1.0
AD28.	Appendix 2 to MGB01-L-E-D-103_02-TRO	Appendix 2 to Trade off reports Optical payload trade off report	1.0
AD29.	MGB01-L-E-D-104_01-SDMP	Space debris mitigation plan	1.0
AD30.	MGB01-L-E-D-105_01-ConOps	Concept of Operations (preliminary)	1.0
AD31.	MGB01-L-E-D-106_01-MRS	Mission Requirements Specification	1.0
AD32.	MGB01-L-M-D-107_01-RR	Risk Register	1.0
AD33.	MGB01-L-E-D-207_01-MDD	Mission Description Document	2.1
AD34.	Annex 1 to MGB01-L-E-D-101_01-MDD	Annex 1 to Mission description document	1.0
AD35.	Annex 2 to MGB01-L-E-D-101_01-MDD	Annex 2 to Mission description document	1.0
AD36.	Annex 3 to MGB01-L-E-D-101_01-MDD	Annex 3 to Mission description document	1.0
AD37.	MGB01-L-E-D-101_02-RJ	Requirements justification file	1.0
AD38.	MGB01-L-E-D-207_02-SEP	System engineering plan (phase A1 update)	2.1

AD39.	MGB01-L-E-D-101_04-TRSL	Technology Readiness Status List (phase 0)	1.0
AD40.	MGB01-L-M-D-102_01-SCH	Schedule (phase 0)	1.0
AD41.	MGB01-L-M-D-102_02-CER	Cost estimate report (phase 0)	1.0
AD42.	MGB01-L-E-D-207_04-SysCon	System concept report (phase A1 update)	2.1
AD43.	Appendix 1 to MGB01-L-E-D-103_01-SysCon	Appendix 1 to System concept report	1.0
AD44.	MGB01-L-E-D-207_05-TRO	Trade off reports (phase A1 update)	2.1
AD45.	Annex 1 to MGB01-L-E-D-103_02-TRO	Annex 1 to Trade off reports Constellation design trade off report	1.0
AD46.	Annex 2 to MGB01-L-E-D-103_02-TRO	Annex 2 to Trade off reports Optical payload trade off report	2.1
AD47.	Appendix 1 to MGB01-L-E-D-103_02-TRO	Appendix 1 to Trade off reports Constellation design trade off report	1.0
AD48.	Appendix 2 to MGB01-L-E-D-103_02-TRO	Appendix 2 to Trade off reports Optical payload trade off report	2.1
AD49.	MGB01-L-E-D-104_01-SDMP	Space debris mitigation plan	1.0
AD50.	MGB01-L-E-D-207_06-ConOps	Concept of Operations (phase A1 update)	2.1
AD51.	MGB01-L-E-D-106_01-MRS	Mission Requirements Specification	1.0
AD52.	MGB01-L-M-D-107_01-RR	Risk Register	1.0
AD53.	MGB01-I-E-D-206_01-GA	GAP analysis report	1.0
AD54.	MGB01-L-M-D-207_03-PMP	Project Management Plan	1.0
AD55.	MGB01-I-M-D-311_03-RMPD	Risk management policy document	1.0
AD56.	MGB01-I-M-D-311_04-RMP	Risk management plan	1.0
AD57.	MGB01-L-E-D-106_01-MRS	Mission_Requirements_Specification	V4.0
AD58.	MGB01-L-E-D-308_01-SEP	System engineering plan (detailed update A phase)	V4.0
AD59.	MGB01-L-E-D-308_02-TP	Technology plan	V1.0

AD60.	MGB01-L-E-D-308_03-IRD	Interface requirements document	V1.0
AD61.	MGB01-L-E-D-308_04-DD	Design definition title	V1.0
AD62.	MGB01-L-E-D-308_05-FT	Function tree	V1.0
AD63.	MGB01-L-E-D-308_06-ST	Specification tree	V1.0
AD64.	MGB01-L-E-D-308_07-TB	Technical budget	V1.0
AD65.	MGB01-L-E-D-308_08-PTRS	Preliminary technical requirements specifications for next lower level	V1.0
AD66.	MGB01-L-E-D-308_09-RTM	Requirements traceability matrix w.r.t. next lower level	V1.0
AD67.	MGB01-L-E-D-308_10-DJ	Design justification file	V1.0
AD68.	MGB01-L-E-D-308_11-TM	Technology matrix	V1.0
AD69.	MGB01-L-E-D-308_12-ConOps	Concept of Operations (phase A update)	V4.0
AD70.	MGB01-L-E-D-309_05-CSD	Coordinate system document	V1.0
AD71.	MGB01-L-E-D-312_01-VP	Verification plan	V1.0
AD72.	MGB01-L-E-D-312_02-VCD	Verification control document	V1.0
AD73.	MGB01-L-E-D-313_01-GAP	Gap analysis report (updated)	V2.0
AD74.	MGB01-L-E-D-314_02-AR	Analysis report	V1.0
AD75.	MGB01-L-M-D-314_03-DNSH-	DNSH Analysis	V1.0
AD76.	MGB01-L-E-D-316_01-SRS	System Requirements Specification	V1.0
AD77.	MGB01-L-E-D-317_01-SSRS	Space Segment Requirements Specification	V1.0
AD78.	MGB01-L-E-D-318_01-GSRS	round Segment Requirements Specification	V1.0
AD79.	MGB01-L-E-D-319_01-USEROPP RS	User Operational Requirements Specification	V1.0
AD80.	MGB01-L-E-D-320_01-VALP	Validation Plan	V1.0
AD81.	MGB01-L-M-D-309_01-PMP	Project management plan	V2.0
AD82.	MGB01-L-M-D-309_02-PT	Product tree	V1.0
AD83.	MGB01-L-M-D-309_03-WBS	Work breakdown structure	V1.0
AD84.	MGB01-L-M-D-309_06-CMP	Configuration management plan	V1.0

AD85.	MGB01-L-M-D-310_01-SCH	Schedule (phase A update)	V3.0
AD86.	MGB01-L-M-D-310_02-CER	Cost estimate report (phase A update)	V3.0
AD87.	MGB01-L-M-D-311_03-RMPD	Risk management policy document	V2.0
AD88.	MGB01-L-M-D-311_04-RMP	Risk management plan	V2.0
AD89.	MGB01-L-M-D-311_05-RAR	Risk assessment report	V1.0
AD90.	MGB01-L-M-D-311_06-RR	Risk Register	V2.0
AD91.	MGB01-L-Q-D-309_07-PAP	Product Assurance Plan (preliminary)	V1.0
AD92.	Appendix 1 to MGB01-L-E-D-308_09- RTM	Requirements traceability matrix	V1.0
AD93.	Appendix 2 to MGB01-L-E-D-308_09-RTM	Requirements traceability matrix w.r.t. next lower level	V1.0
AD94.	MGB01-L-E-D-322_01-OE	Orbital_Elements	V1.0
AD95.	MGB01-L-M-D-309_01-PMP- Appendix	List_of_Tailor_Document Appendix to Project management plan	1.1

1.2 Reference documents

No	Doc title	Doc Identifier	Re
RD1.	Project Planning and Implementation	ECSS-M-ST-10C	Re.1

1.3 Acronyms list

Acronyms list is presented in AD5.

2 Introduction

This document is issued in reference to Contract No. AU/132/V-206/ZW/ZOT/USŁ/SS/2022/341 dated 24 May 2023 (AD2) It has been prepared in the context of the Recovery and Resilience Facility (RRF) and the Polish National Recovery and Resilience Plan (KPO).

The MIKROGLOB project is implemented under Investment A2.6.1 – "Expansion of the national system of monitoring services, products, analytical tools, and supporting infrastructure using satellite data."

This report constitutes one of three documents (Mission Definition Review, Preliminary Requirements Review, Critical Design Review) indicated in the official KPO monitoring table as qualitative indicators for milestone A9L.

The project work under milestone A9L was divided according to ECSS methodology into three phases:

- Phase 0/A (mission feasibility study),

- Phase B (early mission definition),
- Phase C (detailed mission definition).

For the purpose of preparing the reports that serve as qualitative indicators for the milestone, and using the report names provided in the KPO documentation description, the following assignment of phases to reports will be applied:

- Phase 0/A – Mission Definition Review Report,
- Phase B – Preliminary Requirements Review Report,
- Phase C – Critical Design Review Report.

This document, the Mission Definition Review, provides a public summary of the results from Phase 0/A and accompanies the reporting obligations of the Contracting Authority to Polish and EU institutions.

Due to the incremental nature of the project's implementation, the following study refers to one or more applicable documents at a time. Multiple references are used wherever the contracting authority specified deliveries of documents in an incremental form.

3 Scope

This document covers the full scope of activities undertaken during Phase 0 and A of the MIKROGLOB project. The work conducted led to:

- the definition of high-level mission objectives and user needs (AD3, AD8),
- consolidation of system-level requirements (AD31, AD76),
- development of a coherent mission concept and architectural options (AD9, AD42),
- completion of trade-off analyses and identification of optimal solutions (AD24, AD44),
- development of key planning, management, and risk documents (AD54, AD81, AD87),
- establishment of technical and programmatic baselines for the next phase (AD80, AD83).

The report reflects inputs from the Contractor and participating entities and documents the formal status presented during MDR (AD12), CVR (AD6), and PRR (AD10) reviews.

4 Purpose

The purpose of this document is to provide a concise and structured summary of Phase 0/A results, demonstrating the technical maturity and planning readiness of the MIKROGLOB project for transition to Phase B.

It supports the justification for continued funding under the Polish Recovery and Resilience Plan (KPO) and provides a reference for evaluating the project's alignment with the objectives of the RRF mechanism.

Moreover, the report facilitates Contractor's compliance with contractual reporting obligations, as defined in §2(13) of the Agreement (AD1), including the submission of required technical information.

5 Project Overview

The MIKROGLOB project is a national satellite initiative aiming to provide strategic Earth observation capabilities using a constellation of micro-satellites. Phase 0/A laid the foundation for this effort by identifying user requirements (AD79), defining system objectives (AD31), and establishing feasible technical and programmatic architectures (AD42, AD76).

Activities in this phase included extensive mission analysis, definition of system functionalities, and preliminary design efforts focused on the space and ground segments. The outputs were validated through three successive review milestones: the Mission Definition Review (MDR, AD12), Concept Verification Review (CVR, AD6), and Preliminary Requirements Review (PRR, AD10).

Throughout this phase, multiple iterations of key documents—such as the Mission Description Document (AD9, AD33), System Engineering Plan (AD18, AD58), System Concept Report (AD22, AD42), and Risk Register (AD32, AD90)—helped mature the system-level understanding and prepare for the detailed design phase.

The project has maintained alignment with ECSS standards (RD1), ensured active stakeholder engagement, and followed best practices in risk and configuration management. These foundations enable a confident transition into Phase B, where detailed subsystem development and interface definitions will proceed based on the approved baseline.

5.1 Phase Status Summary

Phase 0/A of the MIKROGLOB project commenced with the objective to define and validate the mission concept. It was divided into two main subphases:

- Phase 0 focused on the identification of user needs, derivation of mission objectives, and initial concept studies (AD3, AD9).
- Phase A concentrated on consolidating requirements, maturing the system architecture, and preparing for the detailed definition phase (AD42, AD76).

All planned milestones (MDR, CVR, PRR) were successfully completed and concluded with acceptance of the submitted documentation packages (AD12, AD6, AD10). The work progressed in accordance with the schedule (AD20, AD85), and no major delays or deviations were observed.

The formal completion of Phase 0/A occurred with the successful PRR, confirming the project's readiness to enter Phase B.

5.2 Work Organisation and Planning

Phase 0/A was conducted through a structured work plan aligned with ECSS project management standards (RD1). Activities were grouped into defined work packages covering mission definition, system engineering, technology assessment, and programmatic planning (AD83).

The execution of work followed the Work Breakdown Structure (WBS, AD83) in line with the approach outlined in the Project Management Plan (AD54, AD81). Task distribution among participating teams was clearly delineated, with responsibilities assigned for each deliverable.

Regular coordination meetings, documentation reviews, and configuration control ensured timely progress and alignment with technical and contractual goals. The planning efforts included preparation of the initial schedule (AD20, AD85), cost estimates (AD21, AD86), and resource allocations for subsequent phases.

5.3 Risk Assessment Summary

Risk identification and assessment activities during Phase 0/A were performed in accordance with the Risk Management Plan (AD88) and ECSS guidelines (RD1). The Risk Register (AD90) documented over 20 technical, programmatic, and operational risks, including launch dependency, design maturity, commissioning challenges, and supplier-related constraints.

Each risk was evaluated in terms of likelihood and impact before and after mitigation. Most identified risks were reduced to acceptable levels thanks to preventive actions such as early interface definition, launcher flexibility planning, supplier engagement, and commissioning preparation.

No critical risks remained open by the end of the phase. The final risk posture supports a confident transition into Phase B.

6 Technical Status

6.1 Space Segment

The Space Segment of the MIKROGLOB system was not developed with a single preferred solution during Phase 0/A. Instead, the phase focused on a feasibility assessment of multiple implementation scenarios based on different combinations of satellite buses, payload types, and supplier ecosystems (AD42, AD44).

Each option was elaborated to the same level of detail and documented in the Trade-off Reports (AD44), System Concept Report (AD42), and Space Segment Requirements Specification (AD77). These included assumptions, budgets, risks, and evaluations of technology readiness.

Rather than selecting a single path forward, the outputs provided a structured basis for future decision-making. The goal was to maintain flexibility and support Contracting Authority in the procurement process to be executed before initiation of Phase B.

6.1.1 Architecture Overview

All four evaluated space segment configurations share a set of high-level architectural principles derived from system-level requirements (AD76) and validated through the system engineering methodology defined in the System Engineering Plan (AD58). These include:

- LEO orbital configuration compatible with the desired observation cadence and ground segment visibility;
- Modular bus architecture to accommodate different payload classes and suppliers;
- TT&C in S-band and data downlink in X-band as baseline communication interfaces;
- Compatible mechanical and electrical interfaces for multi-source payload integration;
- Onboard processing and mission autonomy concepts based on identified user needs (AD79, AD69).

The flexibility and scalability of the architectural concepts allow adaptation to evolving procurement strategies and future constellation evolution. Detailed subsystem-level breakdowns and assumptions were captured in the Design Definition Document (AD61).

6.1.2 Preliminary Subsystem Requirements and Designs

Phase 0/A produced draft definitions of key subsystems based on the system architecture options developed in the System Concept Report (AD42) and Trade-off Reports (AD44). Requirements were defined at a high level, reflecting commonalities across the considered implementation scenarios. The following areas were addressed:

- Attitude and Orbit Control System (AOCS): baseline concept foresees a combination of reaction wheels, star trackers, and magnetorquers, supporting agile pointing and precise georeferencing;
- Electrical Power Subsystem (EPS): preliminary budgets accounted for solar array sizing and battery autonomy for varying payload power demands;
- Command and Data Handling (C&DH): generic avionics architecture based on modular onboard computer and fault-tolerant design;
- Communication subsystem: proposed architecture includes dual-band telemetry (S-band) and high-speed data downlink (X-band) with support for ground segment compatibility;
- Payload Interface and Structural Design: multiple configurations reviewed to support both national and foreign optical payloads, with interface margins included for mechanical and thermal constraints.

These preliminary subsystem definitions were compiled in the Space Segment Requirements Specification (AD77), Design Definition Document (AD61), and Technology Plan (AD59), laying the groundwork for future detailed design and procurement activities.

6.1.3 Interface Definition Status

Phase 0/A, interface definitions were initiated at system and segment level to support architectural studies and trade-off evaluations. While full interface control documentation was not expected at this stage, several key assumptions and bounding conditions were established (AD60, AD77).

For the space segment, interface considerations included:

- Payload-to-platform interfaces: Mechanical, electrical, and data links were specified in general terms to accommodate both national and foreign optical payload options. Envelope constraints, power and thermal load limits, and data bandwidth needs were compiled based on trade-off results (AD44, AD59).
- Internal platform interfaces: Avionics and subsystem data buses were preliminarily defined using modular and fault-tolerant concepts suitable for different configurations (AD61).
- Space-to-ground interfaces: Baseline communication assumptions included S-band for TT&C and X-band for payload data, aligned with prospective ground station capabilities (AD69, AD78).

While detailed ICDs were not issued, an initial Interface Requirements Document (IRD, AD60) and related assumptions were validated during the PRR.

6.2 Ground Segment

The Ground Segment of the MIKROGLOB system was conceptually developed during Phase 0/A to ensure compatibility with multiple space segment configurations and to provide robust operational and data management capabilities. The architectural approach reflected the mission's objective to deliver timely, secure, and user-friendly Earth observation services (AD42, AD50, AD78).

6.2.1 Architecture and Functional Concept

The baseline Ground Segment architecture includes the following functional elements:

- Flight Operations Segment (FOS): responsible for satellite command and control, telemetry reception, and platform health monitoring;
- Payload Data Ground Segment (PDGS): handling raw data reception, processing, archival, and dissemination of Earth observation products;
- User Access Segment (UAS): supporting mission planning, user tasking interfaces, data catalogue access, and product ordering.

The system is designed to be scalable and adaptable to different mission configurations, with a modular structure allowing integration of national and/or commercial ground infrastructure providers. Ground station networks were assumed to include both national assets and potential international backup sites.

The operational concept was elaborated in the updated Concept of Operations (AD50) and reflected in the System Concept Report (AD42). These documents outlined service timelines, latency requirements, and interfaces between ground elements and the space segment.

6.2.2 Subsystem Definition and Interface Status

Preliminary definitions of the main ground segment subsystems were included in the Ground Segment Requirements Specification (AD78). Although detailed component-level designs were not required in Phase 0/A, high-level functionalities, data flows, and performance parameters were defined.

Interface assumptions addressed:

- FOS-Spacecraft link: using S-band for TT&C with secure uplink/downlink protocols;
- PDGS reception link: based on X-band compatibility with anticipated data rates;
- UAS integration: support for web-based user access, catalogue query, and scheduling;

Internal interfaces: logical and data interfaces among ground subsystems were outlined using standard protocols (e.g. CCSDS, OGC standards where applicable).

Initial considerations for system security, redundancy, and operational autonomy were also addressed, with a view to support both nominal and contingency operations.

6.3 Launch System

As part of the project activities, a market survey was conducted and a number of launch service providers were identified, including at least two compatible with the previously identified space segment configurations and end-user requirements, confirming the possibility of launching the planned satellite constellation into orbit within the timelines aligned with the milestones in the National Recovery Fund (KPO).

6.4 System Engineering and Integration

Phase 0/A of the MIKROGLOB project established the system-level engineering framework and integration principles, setting the foundation for Phase B. Activities were guided by the System Engineering Plan (AD58), aligned with ECSS-E-ST-10C (RD1), and aimed to ensure traceability, consistency, and technical maturity across the system.

6.4.1 Requirements Traceability

A complete Requirements Traceability Matrix (RTM) was developed and documented in AD66 and Appendices AD92–AD93. This matrix links top-level mission objectives and user needs (AD31, AD79) to system requirements (AD76), and further to preliminary subsystem and interface requirements (AD77, AD78).

The traceability structure ensures that every derived requirement is justified and connected to a source, and that each user-driven need is represented in technical terms.

6.4.2 Verification and Validation Planning

Initial Verification and Validation (V&V) planning was completed in accordance with ECSS-E-ST-10-02 and is documented in the Verification Plan (AD71) and Verification Control Document (AD72). These documents define the V&V approach, including:

- Verification methods (test, analysis, inspection, review of design);
- Levels of verification (system, subsystem, equipment);
- Assignment of verification responsibilities;
- V&V traceability to requirements.

A matrix was initiated mapping each requirement to its intended verification method, which will be expanded in Phase B.

6.4.3 AIT Concept

An initial Assembly, Integration, and Testing (AIT) concept was outlined in AD59 and AD61. While Phase 0/A did not require a full AIT Plan, key principles were established:

- Modular integration of platform and payload to enable parallel testing streams;
- Standardised electrical and mechanical interfaces to simplify integration workflows;
- Definition of integration sequences and test campaign stages (e.g., functional testing, environmental testing, end-to-end mission simulations).

AIT assumptions informed subsystem requirements and interface constraints.

6.4.4 Operations Planning Approach

Operational planning principles were defined in the Concept of Operations (AD50, AD69) and elaborated further in the System Engineering Plan (AD58). The operations model includes:

- Multi-phase operations strategy (LEOP, commissioning, routine, contingency);
- On-board autonomy features and ground segment tasking logic;
- Timelines for data delivery, platform monitoring, and payload tasking;
- Interface definitions between operations teams and end users.

Preliminary scenarios for mission scheduling, failure recovery, and maintenance were developed to validate feasibility across multiple architecture options.

7 Programme Management Status

7.1 Schedule and Progress vs. Baseline

The execution of Phase 0/A progressed in alignment with the project's initial schedule, as outlined in the Schedule Documents (AD20, AD85). Key milestones—including the Mission Definition Review (MDR), Concept Verification Review (CVR), and Preliminary Requirements Review (PRR)—were achieved within the planned timeframes.

Minor adjustments to activity sequencing were introduced during Phase A to account for updated trade-off conclusions (AD44) and architectural refinements (AD42), but these did not result in critical path delays. The programme's Gantt chart (AD85) reflects all accomplished milestones and provides the reference for Phase B planning.

7.2 Work Breakdown Structure and Deliverables Overview

The proposed Work Breakdown Structure (WBS, AD83) defined the hierarchical organisation of project activities across system engineering, risk management, technology, and programmatic domains. The structure is supported by the Product Tree (AD82) and will serve as the backbone for deliverable tracking.

7.3 Configuration Management and Documentation

Configuration management activities were implemented in accordance with the Configuration Management Plan (AD84), ensuring full control over document versions, identifiers, and change logs.

All major deliverables were subject to configuration control, including mission definition documents (AD9, AD33), engineering plans (AD18, AD58), requirements baselines (AD76), and trade-off studies (AD44). A standardised document numbering system was used throughout, facilitating traceability and auditability.

Document versions and reviews were logged via RID summaries and review procedures (AD6, AD12, AD10). No configuration anomalies were recorded during Phase 0/A.

7.4 Risk Management

Risk management processes followed the Risk Management Policy Document (AD87) and Risk Management Plan (AD88). A dedicated Risk Register (AD90) was maintained and regularly updated during technical reviews.

Over 20 risks were identified during Phase 0/A, covering launch logistics, supplier reliability, technology maturity, interface definition, and schedule uncertainty. Each risk was analysed for likelihood and impact pre- and post-mitigation, and assigned a responsible owner.

Mitigation strategies included redundant supplier identification, early design freeze assumptions, and technology roadmap definition (AD59). High-risk items were systematically tracked, and all open risks were downgraded to low or medium severity before PRR.

The established risk governance structure will continue into Phase B and beyond, using updated thresholds and mitigation strategies based on new subsystem inputs.

8 Documents Delivered and Reviewed

8.1 Documents Accepted at MDR

Document Identifier	Document Title	Revision
MGB01-L-M-D-000_02-ES-M2	Executive Summary M2	2.0
MGB01-L-E-D-101_01-MDD	Mission description document	2.0
MGB01-L-E-D-101_02-RJ	Requirements justification file	2.0
MGB01-L-E-D-101_03-SEP	System engineering plan (phase 0)	2.0
MGB01-L-E-D-101_04-TRSL	Technology Readiness Status List (phase 0)	2.0
MGB01-L-M-D-102_01-SCH	Schedule (phase 0)	2.0
MGB01-L-M-D-102_02-CER	Cost estimate report (phase 0)	2.0
MGB01-L-E-D-103_01	System concept report (phase 0)	2.0
MGB01-L-E-D-103_02-TRO	Trade off reports	2.0
MGB01-L-E-D-104_01-SDMP	Space debris mitigation plan	2.0
MGB01-L-E-D-105_01-ConOps	Concept of Operations (preliminary)	2.0
MGB01-L-Q-D-111_01-GAD	Glossary_of_abbreviations_and_definitions	2.0

8.2 Documents Accepted at CVR

Document Identifier	Document Title	Revision
MGB01-L-M-D-000_04-ES-M4	Executive Summary M4	3.0
MGB01-L-E-D-206_01-GA	Gap Analysis report (preliminary)	3.0
MGB01-L-E-D-207_01-MDD	Mission description document (phase A1 update)	3.0
MGB01-L-E-D-207_02-SEP	System engineering plan (phase A1 update)	3.0
MGB01-L-M-D-207_03-PMP	Project management plan (preliminary)	1.0
MGB01-L-E-D-207_04-SysCon	System concept report (phase A1 update)	3.0
MGB01-L-E-D-207_05-TRO	Trade off reports (phase A1 update)	3.0
MGB01-L-E-D-207_06-ConOps	Concept of Operations (phase A1 update)	3.0
MGB01-L-Q-D-111_01-GAD	Glossary_of_abbreviations_and_definitions	3.0
MGB01-L-M-D-107_01-RR	Risk Register	1.0
MGB01-L-M-D-311_03-RMPD	Risk management policy document	1.0
MGB01-L-M-D-311_04-RMP	Risk management plan	1.0

8.3 Documents Accepted at PRR

Document Identifier	Document Title	Revision
MGB01-L-E-D-308_01-SEP	System engineering plan (detailed update A phase)	4.0
MGB01-L-E-D-312_02-TP	Technology plan	1.0
MGB01-L-E-D-308_03-IRD	Interface requirements document	1.0
MGB01-L-E-D-308_04-DD	Design definition title	1.0
MGB01-L-E-D-308_05-FT	Function tree	1.0
MGB01-L-E-D-308_06-ST	Specification tree	1.0
MGB01-L-E-D-308_07-TB	Technical budget	1.0
MGB01-L-E-D-308_08-PTRS	Preliminary technical requirements specifications for next lower level	1.0
MGB01-L-E-D-308_09-RTM	Requirements treaceability matrix w.r.t. next lower level	1.0

MGB01-L-E-D-308_10-DJ	Design justification file	1.0
MGB01-L-E-D-308_11-TM	Technology matrix	1.0
MGB01-L-E-D-308_12-ConOps	Concept of Operations (phase A update)	4.0
MGB01-L-M-D-309_01-PMP	Project management plan (phase A update)	2.0
MGB01-L-M-D-309_02-PT	Product tree	1.0
MGB01-L-M-D-309_03-WBS	Work breakdown structure	1.0
MGB01-L-M-D-309_04-WPD	Work package description	1.0
MGB01-L-E-D-309_05-CSD	Coordinate system document	1.0
MGB01-L-M-D-309_06-CMP	Configuration management plan	1.0
MGB01-L-Q-D-309_07_ PAP	Product Assurance Plan (preliminary)	1.0
MGB01-L-M-D-310_01-SCH	Schedule (phase A update)	3.0
MGB01-L-M-D-310_02-CER	Cost estimate report (phase A update)	3.0
MGB01-L-M-D-311_03-RMPD	Risk management policy document	2.0
MGB01-L-M-D-311_04-RMP	Risk management plan	2.0
MGB01-L-M-D-311_05-RAR	Risk assessment report	1.0
MGB01-L-M-D-311_06-RR	Risk Register	2.0
MGB01-L-E-D-312_01-VP	Verification plan	1.0
MGB01-L-E-D-312_02-VCD	Verification control document	1.0
MGB01-L-E-D-313_01-GAP	Gap analysis report (updated)	2.0
MGB01-L-E-D-314_02-AR	Analysis report	1.0
MGB01-L-M-D-315_01-FR	Final Report	1.0
MGB01-L-M-D-315_02-FES	Final Executive Summary	1.0
MGB01-L-M-D-000_02-M6	Executive Summary phase A2 M6	1.0
MGB01-L-E-D-316_01-SRS	System Requirements Specification	1.0
MGB01-L-E-D-317_01-SSRS	Space Segment Requirements Specification	1.0

MGB01-L-E-D-319_01-USEROPP RS	User Operational Requirements Specification	1.0
MGB01-L-E-D-320_01-VALP	Validation Plan	1.0
MGB01-L-Q-D-111_01-GAD	Glossary_of_abbreviations_and_definitions	4.0
MGB01-L-E-D-106_01-MRS	Mission Requirements Specification	4.0

9 Conclusions

Phase 0/A of the MIKROGLOB project has been successfully completed, fulfilling all contractual and technical requirements defined for this stage. The activities undertaken during this phase led to the consolidation of system and subsystem-level requirements, the definition of architectural and interface baselines, and the development of key engineering, verification, and operations plans in alignment with ECSS standards.

All formal reviews— Mission Design Review (MDR), Concept Verification Review (CVR), and Preliminary Requirements Review (PRR)—were completed with positive outcomes. The required documentation packages were submitted, reviewed, and accepted, establishing a comprehensive and coherent baseline for the detailed design phase. These include both technical specifications and management/control documentation, covering space and ground segments.